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MISSOURI NATIVE PLANT SOCIETY

Missouriensis is the official publication of the Missouri Native Plant Society. Founded in 1979 as a non-profit corporation, the Society is devoted to the conservation and study of the plants growing wild in Missouri, to the education of the public about the significance of the native flora and its habitat, and to the publication of related information.

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LEGISLATION

HOUSE BILL 1079 - Protecting Rare and Endangered Species - John Wylie reported on technical problems. NOTE: This was subsequently passed and sent to the governor for signature. Congratulations to all who worked so hard for the passage of this important bill.

Constitutional Amendment #2 - The Board approved a resolution submitted by Wally Weber reading:

> WHEREAS, the combined issues of Missouri's State Parks and Missouri Soil Conservation constitute vital economic and life resources for the State of Missouri and its citizens, and
>
> WHEREAS, the deterioration of funding during the past years has led to an alarming status of topsoil and inadequate state resources for park maintenance and overall operations, and
>
> WHEREAS, the State of Missouri and its citizens have a substantial and rewarding investment in the state park system and agri-business which is in severe jeopardy of long-term and lasting damage if financial remedy is not forthcoming, and
>
> WHEREAS, the recent history of state general revenue appropriation as well as future expectations is inadequate to support the needed revenue for Missouri State Parks and Soil Conservation, and
>
> WHEREAS, Constitutional Amendment #2 offers the opportunity for stable revenue in the immediate future for Missouri's state parks and soil conservation,
>
> NOW, THEREFORE, BE IT RESOLVED BY THE EXECUTIVE BOARD OF THE MISSOURI NATIVE PLANT SOCIETY AS FOLLOWS:
>
> 1. That the MONPS supports the passage of Constitutional Amendment #2 and,
>
> 2. That the MONPS encourages its members and concerned individuals to work vigorously for the passage of Constitutional Amendment #2.

Passed and approved by the Board of the MONPS on the 28th day of April 1984.

Several members of the Board recommended that the St. Louis Chapter of MONPS take passage of Amendment #2 as a project to work on in the St. Louis area.

Paul Nelson introduced Mrs. Dorothy Seibert of the Federal Garden Clubs of Missouri, which is also supporting passage of Constitutional Amendment #2.

CONFERENCE ON MISSOURI STATE PARKS

Wally Weber and Paul Nelson announced that the Mo. State Parks Association will be sponsoring a Conference on State Parks at Lindenwood College June 15-17.

Wally Weber requested that the MONPS appropriate $50 for the conference which will be under the direction of Dr. Susan Flader of Columbia, MO. This appropriation was approved.

CHANGE IN RESPONSIBILITIES OF THE VICE PRESIDENT

At the suggestion of Ginny Wallace, the following change in the by-laws was adopted by the Board: Article V, Section 3, changed to read:

"The Vice-President shall preside in the absence of the President, SHALL BE RESPONSIBLE FOR STATE BOARD AND ANNUAL MEETING PROGRAMS AND WILL GIVE NOTIFICATION OF SUCH MEETING TO THE GENERAL MEMBERSHIP, and shall perform other recognized functions of the office. The Vice-President shall become President if the office of President becomes vacant. The Vice-President will automatically be nominated as President for the next election."

Article XI, Section 4, changed to read:

"ADEQUATE NOTIFCATION OF THE DATE, TIME, AND PLACE OF THE MEETINGS OF THE BOARD OF DIRECTORS SHALL BE GIVEN BY THE VICE-PRESIDENT to each Director." (Changed from Secretary to Vice-President).

ANNUAL MEETING

The Annual Meeting of the Missouri Native Plant Society will be held September 22 and 23.
Save those dates.

The meeting was adjourned and field trips were then held.

- J. Webdell
Secretary

MISSOURI'S INTERESTING FLORA: Myosotis stricta

Art Christ[1]

For several years there has been a large area of small plants with tiny blue flowers growing in the lawn at Bee Tree County Park. The plants start to flower in early spring and continue to grow taller and branch from their bases until they reach from 0.5 to 2.0 dm in height. This species is Myosotis stricta Link. (Small-flowered Forget-me-not). Bee Tree County Park seems to be the only place in Missouri where this species has been found. There is a record of it's being found in Illinois in St. Clair County. I went to the Missouri Botanical Garden herbarium to determine whether there were any specimens of this species from Missouri, but there were none. In fact there were only about eight specimens of this species from the entire United States, with most of the specimens having been collected in the New England states.

Mysosotis stricta Link. has tiny blue flowers, sometimes with yellow centers. The flowers are only 2-4 mm broad with at least the lower flowers bracted. The pedicels are shorter than the calyx. The leaves are oblong or lanceolate with blunt tips, and are pubescent with mixed, straight and divergent hooked hairs. The species most resembling Myosotis stricta is M. arvensis (L.) Hill., which has all the flowers bractless and the pedicels longer than the calyx.

Myosotis stricta Link. is a native of Europe, as is the true Forget-me-not (Myosotis scorpioides L.), which has larger blue flowers and which rarely escapes from gardens. Myosotis stricta Link. is found along roadsides and in old fields. It is local in southern Quebec and southern Ontario, south to southern New England, Virginia, Ohio, Indiana, and Iowa. It flowers between May and August.

Myosotis stricta belongs to Boraginaceae (Borage family). The generic name Myosotis is composed of the Greek "myos," meaning "of a mouse," and "ous," meaning "ear," from the soft, short leaves of some species. The specific name stricta means "upright."

[1]3458A Watson Rd., St. Louis, MO 63139

Myosotis stricta Link.

Making a List and Checking It Twice

Sherry Morgan[1]

Someone besides Santa Claus is working on a list these days. That someone is the U.S. Fish and Wildlife Service. The Service has recently revised the list of plants being considered for Federal listing. This new Notice of Review is a supplement to the last Notice that was published in 1940. Only changes made in the 1980 Notice are published in the 1983 Notice. Copies of both publications may be obtained from: Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240. Request the Federal Register of 12/15/80 and 11/28/83.

Missouri now has 25 plants proposed for Federal listing (Table 1.). Species that were dropped from consideration for listing are:

Carex socialis Mohlenbr. & Schwegm.	A Sedge
Chelone obliqua L. var. speciosa Pennell & Wherry	Rose Turtlehead
Delphinium treleasei Bush	Trelease's Larkspur
Leitneria floridana Chapm.	Corkwood
Saxifraga pensylvanica L. var. forbesii (Vasey) Engl. & Irmsch.	Forbes' Saxifrage

Rangewide status indicates that these taxa are too widespread to warrant Federal listing. However, status at the state level has not changed.

New additions to the list of Missouri plants under Federal review are:

Polygonum pensylvanicum L. var. eglandulosum J. C. Myers	Pinkweed
Tradescantia ozarkana Anderson & Woodson	A Spiderwort
Trifolium stoloniferum Eat.	Running Buffalo Clover

More information on these species follows.

[1]Missouri Dept. of Conservation, P. O. Box 180, Jefferson City, MO 65102

Endangered Species	Common Name	Family
Isotria medeoloides	Small Whorled Pogonia	Orchidaceae
Under Review (12/15/80 & 11/28/83)		
Arabis missouriensis var. *deamii*	Deam's Rock Cress	Brassicaceae
Asclepias meadii	Mead's Milkweed	Asclepiadaceae
Aster furcatus	Unnamed Aster	Asteraceae
Boltonia asteroides var. *decurrens*	Starwort	Asteraceae
Calamagrostis insperata	Reed Bent Grass	Poaceae
Callirhoe bushii	Bush's Poppy Mallow	Malvaceae
Castanea ozarkensis	Ozark Chinquapin	Fagaceae
Dodecatheon frenchii	French's Shooting Star	Primulaceae
Draba aprica	Whitlow Grass	Brassicaceae
Geocarpon minimum	Geocarpon	Caryophyllaceae
Heuchera missouriensis	Missouri Alum Root	Saxifragaceae
Lesquerella filiformis	Bladder-pod	Brassicaceae
Lindera melissifolia	Pondberry	Lauraceae
Neviusia alabamensis	Alabama Snow Wreath	Rosaceae
Phlox bifida ssp. *stellaria*	Unnamed Phlox	Polemoniaceae
Plantago cordata	Heart-leaved Plantain	Plantaginaceae
Platanthera leucophaea	Prairie White-fringed Orchid	Orchidaceae
Polygonum pensylvanicum var. *eglandulosum*	Pinkweed	Polygonaceae
Polymnia laevigata	Smooth Leaf-cup	Asteraceae
Silene regia	Royal Catchfly	Caryophyllaceae
Sporobolus ozarkanus	Bald Grass	Poaceae
Sullivantia renifolia	Sullivantia	Saxifragaceae
Tradescantia ozarkana	Unnamed Spiderwort	Commelinaceae
Trifolium stoloniferum	Running Buffalo Clover	Fabaceae
Trillium pusillum var. *ozarkanum*	Ozark Wake Robin	Liliaceae

Table 1. Missouri Plants of Federal Concern.

Pinkweed

Polygonum pensylvanicum L. var. eglandulosum J. C. Myers

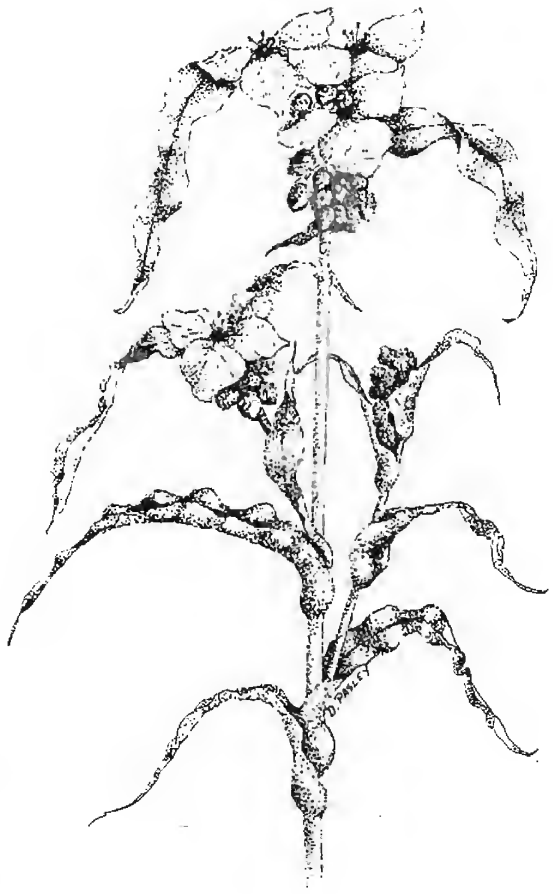
The genus Polygonum includes the knotweeds, smartweeds, and climbing buckwheat. Twenty-three species are found in Missouri and mature fruits are required for identification. The generic name Polygonum comes from the greek poly, meaning many, and gonu, meaning knee or joint. The name emphasizes the characteristic thickened joints of the stem.

Pinkweed (Polygonum pensylvanicum) is an erect annual plant growing to six feet tall. Plants branch and have alternate, lanceolate leaves 10-15 cm. long. Stipules (leafy appendages) at the base of the leaves form a lopsided sheath around the stalk. Tiny rose to white flowers are borne in numerous dense spikes, 18-32 cm. long. These spikes occur at the ends of the stems and branches, and are upright instead of arching or drooping. Polygonum pensylvanicum is a highly variable species and six varieties have been described throughout the range (three occur in Missouri).

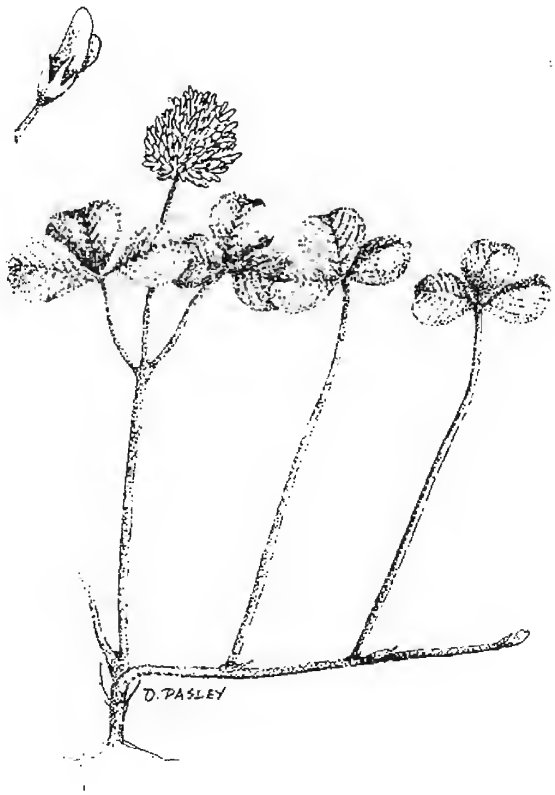
Pinkweed is found throughout Missouri in wet ground bordering sloughs, streams, oxbow lakes and ponds. It is also found on gravel bars, waste ground, and along roadsides and railroads. The fruits of this species are an important source of food for waterfowl and songbirds. This plant and other smartweeds dominate exposed mudflats in the summer months. Polygonum pensylvanicum flowers and fruits from May to October.

Only the variety eglandulosum is on the Federal proposed list. This variety is distinguished by the absence of hairs on the lower leaf surfaces and the lack of glandular hairs on the main flower-stalks.

Var. eglandulosum is known from Greene County, Missouri, and the shoreline of Lake Erie in Erie and Ottawa counties in Ohio (Spooner et. al., 1983). Dr. Paul Redfearn (Southwest Missouri State University) made the first known collection of this plant in Missouri (Steyermark, 1963). The specimen was taken from the muddy banks of a small stream near the east end of a lake, northeast of Springfield. Ohio specimens are from calcareous shorelines, gravel bars, sand beaches, and mudflats (Spooner et. al., 1983).



Tradescantia ozarkana



Trifolium stoloniferum

Spiderwort

Tradescantia ozarkana Anderson & Woodson

The spiderworts (Tradescantia) are grouped in the family Commelinaceae with the dayflowers (Commelina). About 60 species of Tradescantia are found in temperate and tropical America. Most species are semi-succulent plants with flowers in various shades of purple, blue, rose, and pink or white. Eight species are known from Missouri.

The genus Tradescantia was named for John Tradescant, who was appointed head gardener to Charles I around 1629. Tradescant also maintained a museum on his own property and collected plants, birds, fish, shells, insects, minerals, and other natural treasures. His son visited the colony of Virginia to collect plants and among them was the plant that came to be known as Tradescantia virginiana (Anderson and Woodson, 1935). The first published account of the genus was written in 1623, based on plants grown from the collections made in Virginia.

Sir William Hooker, director of Kew Garden in London from 1841-1865, wrote that the common name "spiderwort" stemmed from the belief that the plant was effective in treating the bite of a certain spider.

Tradescantia ozarkana was described in 1935 by Edgar Anderson and R. E. Woodson of Missouri Botanical Garden. Anderson published many papers on Tradescantia, not only on taxonomy but also cytology and genetics of the genus.

Tradescantia ozarkana is a perennial plant, rather stout in appearance, 15-60 cm tall. The leaves are crowded on a short stem, 2.5-10.5 cm long. The upper part of the leaf blades are broad and abruptly narrow into a sheath that clasps the stem. Leaves are pale green, 13-50 mm wide and 10-28 cm long, with margins that may be minutely hairy. Flowers occur in clusters and vary in color from white to pink, rose, or lavender. Stems of individual flowers are 18-32 mm long and are covered with glandular hairs. Sepals are 1 cm long and densely covered with glandular hairs. The species flowers from late April to early June.

Tradescantia ozarkana occurs in southwest Missouri, northwest Arkansas, and eastern Oklahoma (Figure 1). Plants are found in rich rocky woods, steep wooded slopes, and moist ledges along wooded bluffs, over a limestone substrate. Steyermark (1963) noted that the species was formerly abundant along the White River and its tributaries in Missouri. Many populations were flooded out in both Missouri and Arkansas when dams were constructed in the region.

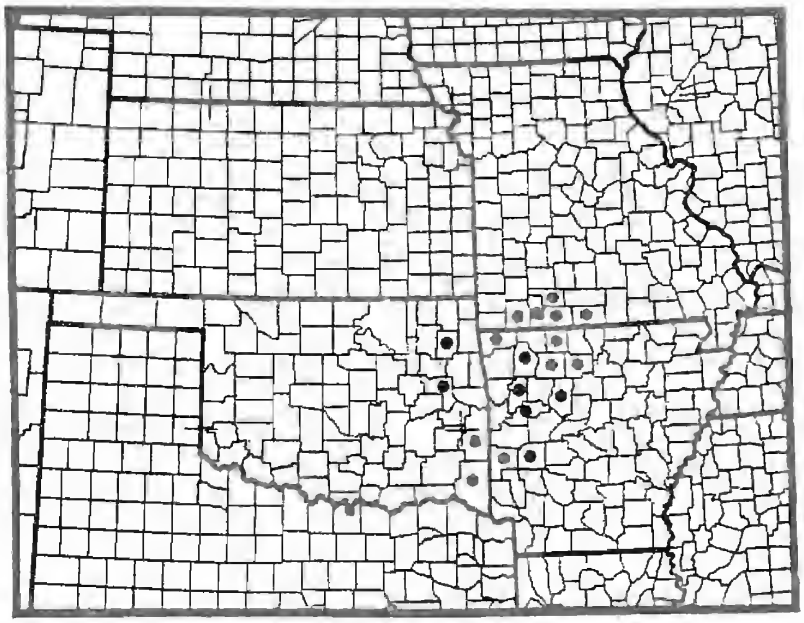


Figure 1. Distribution of Tradescantia ozarkana.

Running Buffalo Clover

Trifolium stoloniferum Eat.

The common name for this plant conjures up the image of a stalwart little clover galloping across the plains with a herd of buffalo. The image is not true but Running Buffalo Clover may have gone the way of the American bison. A recent scientific article reports that Trifolium stoloniferum was last collected in 1940 and field trips to several sites in Missouri and Kansas have been unsuccessful (Brooks, 1983).

There are 12 species in the genus Trifolium that occur in Missouri (Steyermark, 1963). Only three of these are native; the rest have been introduced from Europe and Asia. The generic name Trifolium comes from the Latin tres, meaning three, and folium, meaning a leaf. The name denotes the typical 3-foliate leaves of the group. Compound leaves of three leaflets are found in other groups and are certainly not a diagnostic character for Trifolium alone.

Trifolium stoloniferum is a perennial plant that sends out long runners that root at the nodes. Leaves occur on long upright stems

and the stalks of the three leaflets are of equal length. Flowering stems are 10-40 cm tall and usually bear two large leaves just below the inflorescence. The inflorescence is 32-38 mm wide and is a round head of many (20-60) small white flowers that are tinged with purple. These characters provide a general description of Running Buffalo Clover, but a technical description or diagnostic key should be consulted for correct identification.

Trifolium stoloniferum has been collected from well-drained sites in woodlands. Missouri specimens have also been taken along rivers, streams and springs. Flowering is from mid-April to June and fruiting from May to July.

Dr. Ralph Brooks (University of Kansas) recently published a paper on the characteristics, status, and distribution of the species. Brooks contacted botanists throughout the range of Trifolium stoloniferum and made several field trips himself. He did not locate any extant populations. Therefore he contacted herbaria at more than 50 institutions and borrowed pressed specimens for his study.

Brooks found that many records had been erroneously reported and were based on misidentified specimens. These errors were repeated in floras and manuals. Based on herbarium specimens, Brooks records Running Buffalo Clover from eastern Kansas, Missouri, and Arkansas east through Illinois, Indiana, and Kentucky into Ohio and West Virginia (Fig. 2).

Trifolium stoloniferum apparently had a very local pattern of distribution and was known from less than 30 sites scattered in eight states (Brooks, 1983). All Missouri specimens examined by Brooks were collected between 1830 and 1907. These records are detailed below in the hope that the plant may be rediscovered.

Cooper County: 5 miles above Booneville on the Missouri River, 1833.

Jasper County: Carterville, common along streams, 21 May 1907.
St. Louis County: near St. Louis, 1830. Allenton, May 1880. Big spring near Allenton, 15 May 1880. Allenton, alt. 500 ft., 10 May 1882. Allenton, 16 July 1885. Eureka, Clifty Creek, 18 May 1901.

Wayne County: woods north of Williamsville, 16 May 1893.

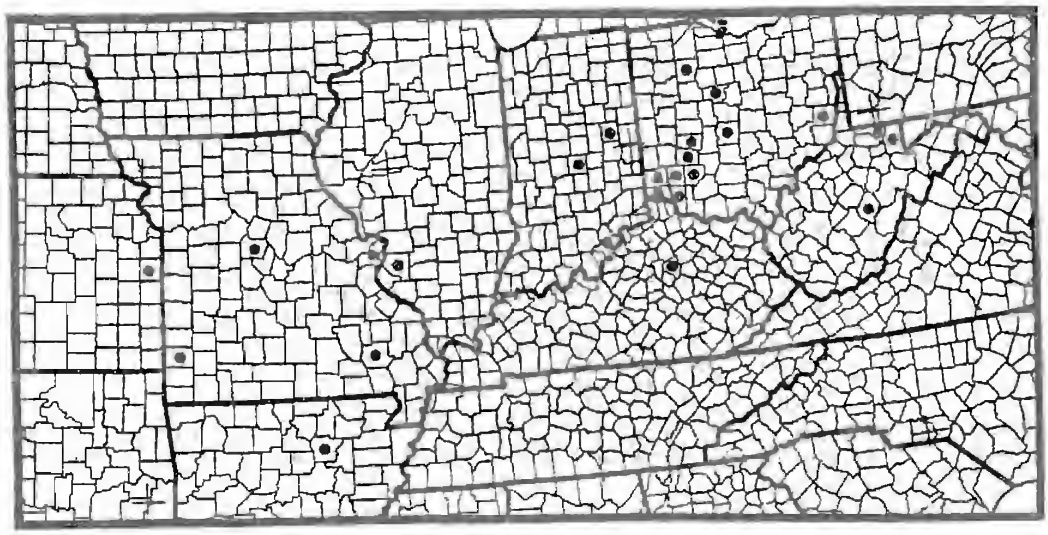


Figure 2. Distribution of Trifolium stoloniferum (Brooks, 1983).

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Two Additions to the Flora of Missouri From Little Bean Marsh

David Castaner[1]

This is the fourth report to the membership of the Missouri Native Plant Society in our series on species new to Missouri from the Herbarium at CMSU (WARM).

During the summer of 1982, two members of the Cyperaceae not listed in the Flora of Missouri (Steyermark, 1963) were found at Little Bean Marsh. As far as I know, these species have not been verified previously for Missouri.

The "Dark-purple" Spikerush

1. Eleocharis atropurpurea (Retz.) J. S. & C. Presl

This species (Figure 1) was found growing in an open mudflat near the entrance to Little Bean Marsh on 10 August 1982. Many specimens were seen growing in the mudflat. The marsh is very close to the Missouri River and it is likely that the species occurs in similar habitats throughout the region. In the central U.S., it is found from Texas and New Mexico north to Iowa, Nebraska, and Colorado but is almost always local to rare (Barkley, 1977; Correll & Correll, 1972).

Since this species has very small or no bristles, it will key in two places in the key to Eleocharis in the Flora of Missouri. The following corrections may be inserted:

On page 274:

e. Styles 2-cleft; achenes 2-sided or with 2 angles ...ee
  ee. Achenes black, shining, about 0.5 x 0.35 mm. ... Eleocharis atropurpurea
  ee. Achenes brown or reddish ...f

On page 275:

m. Annuals with fibrous or fleshy roots (etc.) ...nn
  nn. Achenes black, shining, about 0.5 x 0.35 mm. ...Eleocharis atropurpurea
  nn. Achenes brown or reddish ...n

A voucher specimen, Castaner 7260, 10 August 1982, Platte County, Missouri, has been deposited in the Herbarium of Central Missouri State University (WARM).

[1]Biology Department, Central Missouri State University, Warrensburg, MO 64093.

Note: The authorship of this species is often cited as E. atropurpurea (Retz.) Kunth (as in Barkley, 1977). Both this name (Enum. Pl.2: 151. 1837.) and E. atropurpurea (Retz.) J. S. & C. Presl (Rel. Haenk. 1: 196. 1928.) are based on Scirpus atropurpureus Retz., so the older transfer must take priority (as in Correll & Correll, 1972.)

The "Rocky Mountain" Bulrush

2. Scirpus saximontanus Fern.

This species (Figure 2) was found growing with E. atropurpurea in the same mudflat. As with E. atropurpurea, this species is also found to the west of Missouri. A specimen, referable to Missouri, has been verified as S. saximontanus (Schuyler, 1969), but its location is too poorly stated to trust; accordingly, it is not listed in the Flora of Missouri (Steyermark, 1963). I have seen a photocopy of the specimen and it is labelled "1845 Missouri" by "Carruth" s.n. (U.S. National) Herbarium). In the central U.S., it is native to states west of Missouri and the Missouri River (Correll & Correll, 1972).

Koyama (1962) believes that this entity should be treated as S. supinus L. var. saximontanus (Fern.) T. Koyama; however, the most recent monograph (Schuyler, 1969) treats it as a separate species.

The revised key to this species in the Flora of Missouri (page 286) is as follows:

f. Culms stouter, usually 1.5-3 mm thick (etc.) ...ff
ff. Style 2-cleft ...S. hallii
ff. Style 3-cleft ...S. saximontanus

A voucher specimen, Castaner 7259, 10 August 1982, Platte County, Missouri, has been deposited in the herbarium at CMSU, Warrensburg.

Figure 1. Habit of Eleocharis atropupurea (xerograph .6x).
Figure 2. Habit of Scirpus saximontanus (xerograph .5x).

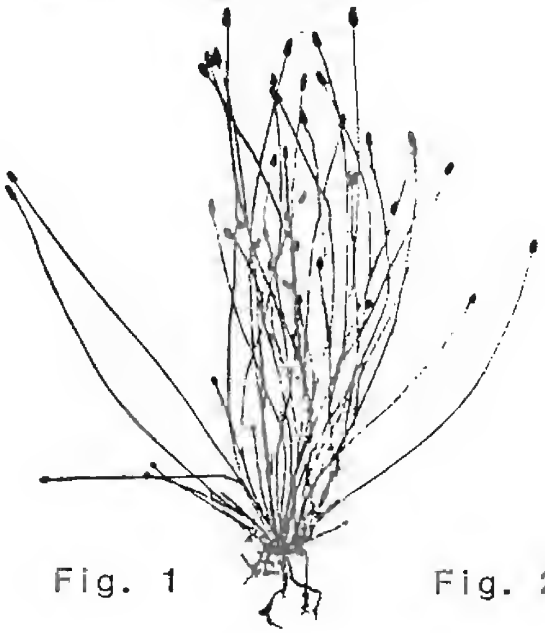

Fig. 1

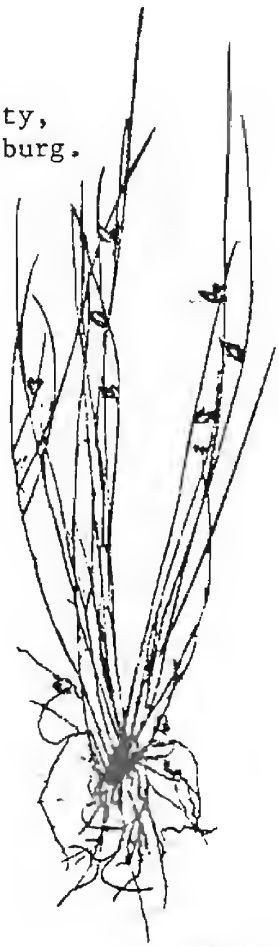

Fig. 2

Commentary

The discovery of these two species on a protected state reservation (park, conservation area, refuge, etc.) once more shows the importance of these units in the preservation of Missouri's Flora. Given a habitat protected from "development," species such as these could survive easily long into the future. No doubt the mudflat at the entrance to this refuse could more "profitably" be put to use! Perhaps as a parking lot or a refreshment stand. Thanks to the concerted effort of those in the DOC and the DNR, plants such as these two unpretentious and unspectacular species at Little Bean Marsh will be around in Missouri for us to enjoy well into the future. We are all grateful!

Correction

Due to an unfortunate typing error in a previous article (Castaner, 1983; Missouriensis 4(4)), the collection date for Aira caryophyllea was incorrect; it should have been 14 May 1971. The correct date also appears elsewhere in another short note (Castaner, 1982). In view of the confusion this has caused, I apologize to all.

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Natural Area Inventory and Floristic Analysis of Fens in Selected Southeastern Missouri Counties Part II

Steve Orzell[1]

This natural community classification scheme uses regionalization concepts described by Thom & Wilson (1980). The system recognizes six Natural Divisions in Missouri through integration of factors like geography, physiography, climate, geologic history, soils, topography, drainage, bedrock geology, biogeography, and presettlement vegetation. The six Divisions are then subdivided into 19 Natural Sections. Natural Divisions and Sections are further divided into community types (i.e., forest, prairie, savanna, wetland, etc.) and finally into natural communities.

A natural community is defined as a group of organisms related to each other and to their environment. Characteristic natural features, including physiognomy, soil moisture, substrate, soil reaction, species composition, vegetation structure, and topographic position, were used to identify, name, and describe types of fen communities.

Although vegetation is frequently used to define natural communities, plant communities in this classification system are not synonymous with natural communities. A plant community is based on vegetational type, whereas a natural community is based on all natural features, and may include one or several plant communities. Each natural community description includes information on: topography, hydrology, soils, community structure, natural processes, distribution, size, status, threat, dominant plants, and characteristic plants.

Dominant plants are those most abundant. Order of listing in description does not imply order of importance. Characteristic plants are typical or representative species of a given fen community type.

This classifiction scheme represents three years of field observations from more than 300 fens in the Missouri Ozarks. Nomenclature follows Steyermark (1963), except where otherwise noted.

Calcareous Seep Fen

Topography, Hydrology, and Soils: Deeply dissected, relatively small drainage basins, generally in upper reaches of gaining streams located on sideslopes in narrow valleys and terraces with slope range of 5-45%. Groundwater issues from shallow bedrock aquifer or perched water table; highly calcareous, forming marly substrate where seepage

[1]Arkansas Natural Heritage Commission, The Heritage Center, Suite 200, 225 East Markham, Little Rock, AR 72201

is diffused, or manifested as a seep-spring. Soil moisture dependent upon seasonal fluctuations; in dry weather, free surface water may be absent, but soil remains wet, with regions of permanent seepage. Organic muck (0-30 cm) or mineral soil, a combination of wet muck interspersed with areas of wet sand, cherty residuum, gastropod shells, and dolomitic fragments from nearby weathered parent material. Bedrock strata usually Eminence or Potosi Dolomite (Cambrian) occasionally exposed, characteristically so in hanging seep-fens with slopes greater than 35%.

Community Structure: Sedges or mixed grasses; sedges short, usually less than 30 cm, often forming tussocks. Grasses medium-tall height, dominant in drier areas or along margins, especially so during the autumnal aspect. Sedges short and sparse in marly ooze areas; shrubs sometimes present; forbs medium height, epiphytic on drier hummocks, conspicuous during late summer and early autumn. Species diversity moderate.

Natural Processes: Occasional to constant saturation by cold, circumneutral, calcareous groundwater. Ferric hydroxide and calcium carbonate precipitates in marly areas. Chemical and physical weathering of surficial bedrock; mass-wasting in areas of excessive slope; fire infrequent; crayfish (Cambarus spp.) excavation "chimneys" are conspicuous acting to aerate and mix substrate. Marly areas are almost "permanently" pioneer successional in character.

Distribution and Size: Principally the Upper and Lower Ozark Section of the Ozark Division, also the Mississippi River Section of the Ozark Border Division. Areas of karst-formed carbonate terrain or Upper Cambrian strata, peripheral to the St. Francois Mountains Section of the Ozark Division. Small in extent, ranging from 0.1 ha to 2.0 ha in size.

Status and Threats: Uncommon to moderately rare, confined largely to first and second stream orders, feeding tributaries to major valleys. Threats include clear-cutting forested buffers, hydrologic alterations, prospecting, and mining for minerals.

Dominant Plants:

Gravelly marl, ooze areas - Carex hystericina Willd., C. leptalea Wahlenb., Fuirena simplex Vahl, Panicum flexile (Guttinger) Scribner, Rhynchospora capillacea Torrey, Scleria verticillata Willd.

Seep-springs - Justicia americana (L.) Vahl, Nasturtium officinale R. Br., Nuphar luteum (L.) Sibth & Smith, rarely Plantago cordata Lam.

Hummock areas - Carex interior L. Bailey, C. lurida Wahlenb., Parnassia grandifolia DC., Rudbeckia fulgida Aiton, and Senecio aureus L. in areas of copious diffuse seepage. Andropogon gerardii Vitman, Liatris pycnostachya Michaux, Rudbeckia missouriensis Engelm., Schizachyrium scoparium (Michaux) Nash (Andropogon scoparius Michaux in Steyermark), and Sorghastrum nutans (L.) Nash on drier hummocks.

Characteristic Plants: Cacalia tuberosa Nutt., Cardamine bulbosa (Schreber) BSP., Carex leptalea, C. lurida, Castilleja coccinea (L.) Sprengel, Chara sp. (alga), Equisetum hyemale L., Liatris pycnostachya, Lobelia siphilitica L., Lysimachia quadriflora Sims, Nostoc sp.(blue-green alga), Physostegia virginiana (L.) Benth., Satureja arkansana (Nutt.) Brig., Selaginella apoda (L.) Spring, Spiranthes lucida (H. Easton) Ames, Valerianella radiata (L.) Dufr.

Sedge-Shrub Fen

Topography, Hydrology, and Soils: Upper to mid reaches of gaining streams or along gaining stretches of interrupted streams in moderate to deeply dissected terrain at toeslope of hills or base of former alluvial terraces along valley walls, slope 0-5%. Groundwater calcareous, circumneutral, diffuse, arising from adjoining toeslope; source shallow unconsolidated aquifer issuing from weathered porous residuum of surrounding uplands. Soil hydric, saturated, bog-like, quaking sensation produced when traversed by foot. Poor internal drainage may result in shallow pooling of water. Soil a saturated muck or mucky peat, generally 60 cm thick, with a maximum recorded depth of 142 cm. Parent material gravelly alluvium and coluvium; bedrock not detectable.

Community Structure: Mat of Carex, Juncus, Typha, and other species; dense tufts of "brown mosses" usually present. Sedges short to medium height, either cespitose, forming tussocks or quaking mats. Shrubs, if present, medium to tall (1.2-2.7 m), forming thickets, or scattered throughout. Species diversity high.

Natural Processes: Constant soil saturation by calcareous groundwater. Flood intolerant, rarely inundated except during floods of great magnitude. Fires retarded woody invasion in presettlement times; windthrow and anaerobic soil conditions severely retard wood invasion.

Distribution and Size: Characteristic of Upper Ozark and Lower Ozark Section of the Ozark Division, closely associated with karst-formed carbonate terrain. 0.1 ha to 2.0 ha in size.

Status and Threats: High quality, undisturbed fens extremely rare. Threats include grazing pressure, ditching clearing for cultivation, road construction, reservoirs, and tailings ponds; excavation of fens for development of commerical lily ponds and fish hatcheries; bulldozing fens to create livestock ponds; excessive well drilling, pumping, and dewatering of shallow aquifers.

Dominant Plants:

Sedge fens - Carex hystericina, C. lurida, C. suberecta (Olney) Britton, C. vulpinoidea Michaux.

Thickets - Boehmeria cylindrica (L.) Sw. and Impatiens capensis Meerb. in thickets of either Alnus serrulata (Aiton) Willd. or Salix spp.

Characteristic Plants: Asclepias incarnata L., Aster puniceus L., Boehmeria cylindrica, Cephalanthus occidentalis L., Chelone grabra L., Cirsium muticum Michaux, Cornus obliqua Raf., Cuscuta sp., Drepanocladus aduncus (Hedw.) Warnst. var. polycarpus (Voit) Roth (moss), Dulichium arundinaceum (L.) Britton, Eupatorium perfoliatum L., Hypericum spathulatum (Spach) Steudel, Impatiens capensis, Juncus effusus L. var. solutus Fern. & Wieg., Lysimachia quadriflora, Mimulus ringens L., Osmunda regalis L., Oxypolis rigidior (L.) J. Coulter & Rose, Parnassia grandifolia, Pedicularis lanceolata Michaux, Phlox maculata L. var. pyramidalis (Smith) Wherry, Physocarpus opulifolius (L.) Maxim., Pycnanthemum virginianum (L.) T. Durand & B. D. Jackson, Rudbeckia fulgida Aiton, Salix rigida Muhlenb., S. sericea Marshall, Scirpus atrovirens Willd., S. polyphyllus Vohl, Solidago patula Mohlenb., S. riddellii Frank, Thelypteris palustris Schott, Typha latifolia L., Viola cucullata Aiton.

Prairie Fen

Topography, Hydrology, and Soils: Valley terraces of larger streams on slopes 5-10%. Soil mesic to wet, seasonally saturated, stable and easily traversed; groundwater calcareous with no external flowage visible. Localized areas of constant internal seepage with muck or mucky peat; seasonally saturated areas of silty clay loam, upper soil horizons with organic matter absent or up to 8 cm. Parent material gravelly alluvium or colluvium over dolomite bedrock; bedrock not detectable.

Community Structure: Mixed tall grass and herbaceous calciphiles where prairie species associate with modal fen species. Complex plant communities of prairie herbs, grasses (1.8-2.0 m), sedges and ferns; scattered shrubs sometimes present. Some degree of floristic overlap between prairie fens and sedge-shrub fens. High diversity due to juxtaposition of mesic prairie, wet prairie, calciphilic, and hydrophytic species.

Natural Processes: Groundwater seepage; occasional fire in larger fens; periodic drying of free surface water on elevated soils, but still remaining moist.

Distribution and Size: Upper Ozark and Lower Ozark Section of the Ozark Division. 0.8 ha to 6.8 ha in size.

Status and Threats: In presettlement times a major ecosystem in some Ozark valley headwaters, ranging from 24 ha to 40 ha; only six remnants, five within private ownership, and one unprotected with U.S. Forest Service ownership. Prairie fens are an endangered community, none are presently protected. Threats include grazing, ditching, and mineral mining.

Dominant Plants:

Organic soils with constant seepage - Lysimachia quadriflora, Rudbeckia fulgida, Scirpus atrovirens, Solidago patula.

Seasonally saturated mesic soils - Andropogon gerardii, Sorghastrum nutans, Spartina pectinata Link.

Characteristic Plants: Agrimonia parviflora Aiton, Castilleja coccinea, Cicuta maculata L., Cornus obliqua, Dichanthelium clandestinum (L.) Gould (Panicum clandestinum L. in Steyermark), Helianthus grosseserratus Martens, H. mollis Lam., Lythrum alatum Pursh, Onoclea sensibilis L., Oxypolis rigidior, Pycnanthemum tenuifolium Schrader, Rudbeckia fulgida, Scirpus atrovirens, Silphium integrifolium Michaux, S. terebinthinaceum Jacq., Thalictrum revolutum DC., Veronicastrum virginicum (L.) Farw.

Wet Meadows

Topography, Hydrology, and Soils: Terraces or shallow depressions or relatively wide floodplains along streams or medium-size rivers. At or just above the water table; nearly level, slope 0-5%, aspect neutral. Groundwater calcareous derived either from valley aquifer, diffuse seepage from a hillside aquifer, or small springs with a definite orifice, occasionally collecting in a slow-moving channel. Hillsides and colluvial slopes may contribute overland runoff during periods of heavy rainfall. Water always present, never a limiting factor. Loam, silty loam, silty clay loam mineral soils, mesic or wet when saturated; sometimes mucky organic soils, wet to hydric. Parent material sandy, gravelly alluvium; bedrock not detectable.

Community Structure: Open to semi-open, homogeneous stands of tall rushes or rhizomatous mats of Acorus calamus L. in wetter situations;

low matted "brown mosses" often present in wetter situations; emergent aquatic species where hydric conditions prevail; forbs prominent in late summer; shrubs present only in hydric situations, in which alder may become abundant.

Natural Processes: Production of hydrogen sulfide odor from shallow pools dominated by Acorus calamus, presumably by-products of anaerobic microbes. Fluctuations of water table in valley aquifers. Scirpus dominated meadows flourish in wet seasons when aquifer is at highest level, may be cut for hay when water table elevations depress during dry season. Degree of wetness quite variable; subject to frequent flooding. Fires infrequent.

Distribution and Size: Mississippi River Section of the Ozark Border Division. St. Francois Mountains Section, Lower and Upper Ozark Section of the Ozark Division. Widespread, probably throughout much of the Ozark region. 0.2 ha to 1.2 ha in size.

Status and Threats: Uncommon; grazing pressure, ditching, and mowing for hay have disturbed most known sites beyond natural area significance.

Dominant Plants:

Wet-hydric situations — Acorus calamus, Typha latifolia, Ludwigia palustris (L.) Elliott.

Wet to wet-mesic sites - Scirpus atrovirens, S. pendalus Muhlenb. (S. lineatus Michaux in Steyermark).

Characteristic Plants: Agrimonia parviflora, Alisma plantago aquatica L., Asclepias incarnata, Bidens cernua L., Carex lupulina Willd., C. vulpinoidea, Conium maculatum L., Cicuta maculata, Cyperus strigosus L., Eleocharis compressa Sullivant, E. obtusa (Willd.) Schultes, Helenium autumnale L., Impatiens capensis, Iris virginica L., Juncus effusus var. solutus, J. tenuis Willd., Leersia oryzoides (L.) SW., Lemna valdiviana Philippi (in standing pools), Ludwigia alternifolia L., L. palustris, Lycopus americanus Mohlenb., Lysimachia nummularia L., Mentha piperita L., Mimulus ringens, Nasturtium officinale, Onoclea sensibilis, Polygonum spp., Penstemon digitalis Nutt., Phlox glaberrima L., Sagittaria latifolia Willd., Sparganium americanum Nutt., Teucrium canadense L., Verbesina alternifolia (L.) Britton, Vernonia baldwinii Torey, V. missurica Raf., Viola cucullata.

Calcareous Seep Forest

Topography, Hydrology, and Soils: Terraces or floodplains with a slope of 0-5%; aspect neutral. Soil somewhat poorly drained loam,

seasonally saturated, to moist in dry periods. Source of water a combination of calcareous seepage and rainwater. Soil depth greater than 40 cm, characteristically equivalent to wet mesic bottomland forest; parent material alluvium, bedrock not detectable.

Community Structure: Mixed deciduous bottomland hardwoods. Closed tree canopy of medium height (18-27 m). Understory medium to tall (4.5-9.0 m), generally well developed; shrubs and vines often forming tangled thickets. Ground cover - mixed sedges, ferns, and herbs; hummocks of bryophytes often well developed at tree bases or in areas subject to shallow ephemeral ponding. Diversity high with mixture of wet-mesic floodplain forest species and fen calciphiles.

Natural Processes: Becoming dry during drought; fire absent; internal ponding of rainwater in spring and during heavy rainfall.

Distribution and Size: Lower Ozark Section and St. Francois Mountains Section of the Ozark Division. 0.2 ha to 4.0 ha in size.

Status and Threats: Extremely rare due to logging and grazing, only six occurrences presently known within the study area.

Dominant Plants:

Acer rubrum L., Carpinus caroliniana Walter, Climacium americanum Brid. (moss), Fraxinus pennsylvanica Marshall.

Characteristic Plants: Carex lurida, C. tribuloides Wahlenb., Dichanthelium clandestinum (Panicum clandestinum in Steyermark), Diospyros virginiana L., Gentiana andrewsii Griseb., Lindera benzoin (L.) Blume, Onoclea sensibilis, Pedicularis lanceolata, Rudbeckia fulgida, Scirpus polyphyllus, Solidago gigantea Aiton, S. rugosa Aiton, Thuidium delicatulum (Hedw.) Mitt. (moss), Ulmus rubra Muhlenb.

Calcareous Seep-fed Streams

Topography and Hydrology: Headwaters of secondary and third order Ozark streams, usually in narrow valleys of highly dissected terrain, sometimes in broad valleys where bedrock is at or near the surface. Permanent flow of clear, cold, calcareous groundwater; nurtured by diffuse seepage or springs of small discharge with a definite orifice. Medium to high gradient streams of shallow depth (1-60 cm); usually a bedrock floor of Cambrian dolomite, often riddled with potholes, pools, or rock terraces with small cascading waterfalls, alternating with shallow runs, and small gravel bars.

Community Structure: Microassociations of calcareous seep fen species aggregated along narrow streamside corridors or randomly scattered in streambed; absence of submerged aquatic spermatophytes typical of deep quiet waters; algae and bryophytes present.

Natural Processes: Perennial flow sustained by calcareous groundwater. Possible migrational routes for dispersal of fen species in the Ozark region.

Distribution: Upper and Lower Ozark Section and St. Francois Mountains Section of the Ozark Division and Mississippi River Section of the Ozark Border Division.

Status and Threats: Uncommon; undisturbed watersheds becoming increasingly rare; threats include clear-cutting, siltation, water pollution, and drainage from tailings ponds.

Dominant Plants:

Carex torta Boott, Parnassia grandifolia, Rudbeckia fulgida, Senecio aureus.

Characteristic Plants: Alnus serrulata, Aster novae angliae L., A. puniceus, Campanula americana L., Cercis canadensis L., Conocephalum conicum (L.) Lindb. (liverwort), Eupatorium coelestinum L., E. perfoliatum, Gentianella quinquefolia (L.) Small (Gentiana quinquefolia L. in Steyermark), Hamamelis vernalis Sarg., Hydrangea arborescens L., Justicia americana, Lobelia siphilitica, Lysimachia quadriflora, Nasturtium officinale, Nuphar luteum, Oxypolis rigidior, Plantago cordata, Salix sericea, Satureja arkansana, Scirpus americanus Pers., Selaginella apoda, Senecio aureus, Silphium perfoliatum L.

Literature Cited

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Steyermark, J. A. 1963. Flora of Missouri. Iowa State Univ. Press, Ames. lxxxiii + 1728 pp.

Acknowledgments

I extend my sincere appreciation to Paul W. Nelson for his valuable suggestions and aid in preparation of the fen classification scheme.

NEWS & NOTES

Letter from the Missouri Department of Conservation

"We are happy to report that House Bill 1079 which extends legal protection to endangered native plants has passed both houses of the legislature and now awaits the Governor's signature to become law. We certainly appreciate the support your organization provided and the legislative contacts your members made. Your support made passage possible in this short session.

"We all owe a debt of gratitude too to Representatives Leroy Braungardt of Moscow Mills and Robert Dunning of Clinton who introduced the bill and shepherded it through the legislative process.

"This important legislation extends legal protection to endangered native plants, enhances a landowner's ability to protect and control harvest of such plants and enables Missouri to comply with federal requirements for the regulated harvest and sale of ginseng and other endangered species.

"Many thanks."

- John E. Wylie
Natural History Officer

Mohlenbrock Wins Award

Native Plant Society Board Member Dr. Robert Mohlenbrock was awarded the Meritorious Teaching Award at the Association of Southeastern Biologists (ASB) Annual Meeting in Memphis, Tennessee, April 11-14. The prestigious award is presented annually to recognize excellence in teaching biology by an ASB member. Candidates for the award must be active or recently retired and have taught biology in a southeastern institution for at least ten years. Other considerations include recognition by the candidate's institution and the quality of students for whom the nominee has provided inspiration for advanced study and careers in biology. ASB currently has 1,300 members from all disciplines of biology in the southeast.

Constitutional Amendment No. 2

This important amendment will be coming to the vote in the next few months. Please make yourself familiar with the issue (see last page of this volume). Contributions and requests for further information should be sent to: Citizens' Committee for Soil, Water and State Parks, 312 East Capitol, Jefferson City, MO 65101.

Botanical Contact Wanted

The following is a letter received by the Botany Department of the Missouri Botanical Garden. Someone in MONPS might be interested as well (translated from German):

"Dear employees of the Botanical Garden. I am writing to ask you a big favor. I am an enthusiastic friend of nature and am mainly interested in Botany. I now am looking for nature friends in other countries who have the same interests. I am especially interested in literature about botanical gardens, as well as the plants growing there. I would be very happy to have contact with your institution or one of the people working there.

Many greetings,

G. Dornberger
3400 Zerbst, Magdeburger Str. 29
German Democratic Republic, DDR

A Note from a MONPS Member

"I was happy to see "Wildflowers I Have Grown" by Edgar Denison in Vol. 5, No. 2 of Missouriensis. When I joined the Society I had hoped that there would be a stronger emphasis on this aspect of native plants. Taxonomy and the listing of occurrences of plants is well and good and I support this type of endeavor. But I'm afraid too much of that sort of thing will turn amateurs away from the Society. I am an amateur since I don't make a living as a botanist. I also don't know much about native plants. I do find a challenge, as many amateur gardeners do, in propagating native plants from seed.

"On my property there were no blood roots, golden seals or ginsengs when I purchased it. There are now. I suppose I may be guilty of introducing species into areas where they were not. It is quite probable that these plants were once there before someone cut down all the virgin oaks and tried to farm the rocky soil. Or perhaps it was used only for pasture. A few of the old oaks have grown around the barbed wire that once fenced the place.

"The fact that Mr. Denison has been unable to grow bird's foot violet is interesting. The plant grows wild all over the open areas around here. Maybe with some encouragement and ideas of how to proceed, some interested amateurs could undertake a study as to why it is not possible to grow bird's foot violet. I have great respect for amateur botanists, photographers and microcomputerists. These are some of the areas where amateurs have made contributions to the profession which they have made their avocation.

"Possibly some serious high school scientists could be encouraged to study native plants as science fair projects. I have yet to meet an amateur molecular biologist or brain surgeon!"

- Donald J. Siehr

Volunteer Needed

The Missouri Conservation Department as part of a project for mapping endangered species in the state is microfilming the Steyermark papers. A volunteer is needed for preparation of the maps for microfilming. A discreet nature and dedication to the importance of saving endangered species are the main qualifications for the job. About 16-20 hours of work are involved.

For information call:
Barbara Mykrantz, Archivist
Missouri Botanical Garden
577-5158

Fall MONPS Meeting

The fall and annual meeting has been scheduled for September 22. More details will be coming your way.